7: Jenness--38B (1914-16) 1923 Copper Eskimo
116, 143

"In the preceding section, when describing the individual Eskimos who were made the subjects of measurement, I separated them according to the localities or social groups to which they considered themselves attached. [JMR: i. e., Males were measured in the following groups. A. Akuliakattak group, Dolphin and Union strait. B. Noahogniq group, Dolphin and Union strait. C. Walliaq group, Coronation gulf. D. Asiak group, Coronation gulf. E. Pingangnaqtok group, Coronation gulf. F. Kilusiktok group, Coronation gulf. G. Asiak group, east of Kent Peninsula. H. Kanghiryuaq group, Prince Albert sound. I. Hanerak group, South-west Victoria island. J. Puiviliq group, South-west Victoria island. K. Nagyuktok group, South Victoria island. L. Kigliniq group, South Victoria island. Females were measured in all of these groups save in groups G, I, and J. In addition some women were measured from the Saningaiyoq group, Backs River.]. . . . As far as the physical characteristics of the Copper Eskimos are concerned such a differentiation of the population into local groups has absolutely no importance, for they are all closely connected by ties of kinship and relationship; moreover the groups undergo a reshuffling process every year, so that their composition continually changes and a man in the course of his life-time may belong to as many as half-a-dozen different ones. This is true not only of the basin of Coronation gulf proper, but of the slightly more outlying areas like Prince Albert sound and Minto inlet; for the inhabitants of these places also continually visit and intermarry with the Eskimos south and east of

them. It follows, therefore, that there can be no local variations in physical type throughout this whole region, no features present, let us say, in Prince Albert sound that are not equally present in Bathurst inlet; and this is confirmed by the data given in the preceding section. . . . In the general discussion of the date which is now to follow no attention will be paid to local groups, but the whole region inhabited by the Copper Eskimos will be treated as a unit. This region lies roughly between 67° and 72° north latitude and 102° and 120° west longitude, having Coronation gulf as its geographical centre!!

21:Chown & Lewis D-5 (1958)1959
ND8 Copper Eskimo ND8

[p.13, A]

The Blood Group Genes of the Copper Eskimo[1]

BRUCE CHOWN AND MARION LEWIS
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121
● 143
[131]
This report deals with the blood group and secretor genes of the so-called Copper Eskimo living on Victoria Island and the neighboring mainland, roughly between 100° and 120° west latitude and from the Arctic Circle to 72° north longitude. The report is part of a continuing study under the aegis of the National Museum of Canada of the populations which go to make up the population of Canada.

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[16]
The Copper Eskimo form an almost pure-bred population of about 1000 which has been stationary as to numbers since they were first studied by Jenness ('23) in 1913–16. Where they came from and how long they have lived here is unknown. The caribou and seal were their mainstays, providing food, clothing, fuel and housing materials, while in their territory was native copper which they used both for manufacture and for trade. Neither the east nor the west offered greater attractions, while the south was barred by Athapaskan-speaking Indians. It seems probable that they have occupied their present territory for a long time. On the other hand it is not to be imagined that they lived in complete isolation. Their neighbors 300 miles to the west about the delta of the Mackenzie knew of them, but only dimly; they spoke of them as "the people afar off." To the east and southeast they
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had some slight contact with other Eskimo,
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and undoubtedly there was some intermarriage. With the Indians to the south they were apparently in a constant state of war, of small raids of extermination. So the earliest record we have of them is in Samuel Hearne's journal of his journey from Fort Prince of Wales on Hudson Bay to the mouth of the Coppermine River in 1771; in that venture the Indians who accompanied Hearne killed every Eskimo there encamped. Even so, from tales we were told, it is reasonable to believe that in other raids an occasional Indian woman

[1 [Footnotes appear on p. 13B.—Analyst]

[P-13, B]

The Blood Group Genes of the Copper Eskimo[1]

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175
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or child may have been spared and incorporated into the population.

As to the other admixtures there was only a rare contact between Eskimo and people other than Indian from 1771 until about 40 years ago. These were not whaling waters. A few explorers and trades entered the area, some of whom married Eskimo women. These events are so recent that children of these marriages are still living, a number of whom we tested. Today there are two small white settlements, that at Cambridge Bay and that at Coppermine, and several still smaller implants.

[563]

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In the present study 330 out of the total of approximately 1000 were tested. With the help of Corporal and Mrs. D. McDougal of the R.C.M.P., Father LaPointe, O. M. and the Reverend Canon Sperry a detailed genealogy was drawn up. There were no first-cousin marriages.[3] The genealogy could not be carried far enough back to prove or disprove second-cousin marriages. Of the 330, only 10 could be proved to have white ancestors; these 10 were eliminated in gene frequency analysis. Such analysis was carried out for the remaining total 320 and for 46 among them who were apparently unrelated. While there is no significant difference between the two estimates, we think analysis based on the 320 is probably more accurate since phenotypes of low frequency were then represented. The estimates in the tables are so based. There is a high death rate in young adults, so it was unusual to obtain blood from children and both parents. Few genotypes could therefore be defined but in what family data we did obtain, there was no disagreement between expected phenotypes and those found.

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[165]

[122]

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[1] Assisted by a grant from the National Museum of Canada. Dr. Jacques Rousseau, Director.

[2] Postal address, 735 Notre Dame Ave., Winnipeg 3, Man., Canada.

[3] See addendum.

[p.14,A]

126
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SAMPLES, SERA AND METHODS

Samples were collected at Cambridge Bay, Holman Island, Reid Island and Coppermine in April, 1958 and the tests carried out at the Hudson's Bay Company post at Coppermine. With the exception of the specimens from Cambridge Bay (which were venous samples obtained for us by Dr. Gillison of the Department of National Health, sent by air to Coppermine and tested on the third day) all samples were of capillary blood taken into saline and tested on the day of collection.

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The test sera had all been in use in our laboratory for some time so that their specificity and mode of action were well known. We had taken test cells of various known antigen constitution with us; these were used daily to control the results. Five methods were used according to the mode of action of the various sera; agglutination in a capillary tube by untreated serum (Chown and Lewis, '51) indicated below by "capillary;" agglutination in a capillary tube by serum mixed with activated papain (Lewis et al., '58) indicated below by "capillary papain;" the indirect Coombs technique of Race and Sanger ('58) modified to the extent that the final agglutination with anti-human-globulin rabbit serum (Coombs' reagent) was carried out in a capillary tube, indicated by "indirect Coombs;" agglutination in bovine albumin (Lewis and Chown, '57), indicated below by "short albumin;" open well slide, so stated below. In the following the serum is described first; the method is given after the semicolon. The letters in brackets are our code names for the particular serum used. Unless otherwise indicated tests were made at room temperature which varied from 18° to 22°C.

The ABO system. One each, high titre, avid anti-A and anti-B and one anti-A + B from O donor; capillary. One commercial anti-A_1 (absorbed B); open well slide.

The MNSs system. One commercial anti-M; capillary. One commercial anti-N; open well slide. One anti-S (Dev), one anti-s (Chei); capillary. One anti-M^r (UB no. 4), one anti-M^g (HA1); capillary. One anti-Vw(Gill); short albumin. One anti-He (Sha); open well slide.

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The P system. One anti-P (Wil); capillary at refrigerator temperature. One anti-Tj^a (Ell); capillary.

The Rh system. One each anti-C + C^w (comm.), anti-C^w (Boeh), anti-D (Faw); capillary. One each anti-c (Tod), anti-E (McL), anti-e (Hal); capillary papain. A further anti-c (Gal), anti-E (Ros), and anti-e (Sha) for those samples reacting as CcDee or ccDEe; capillary papain. (In every case the reaction with the check serum agreed with the reaction obtained with the primary test serum.) One anti-V (Ros); indirect Coombs.

The Lutheran system. One each anti-Lu^a (TG) and anti-Lu^b (TG); capillary.

The Kell system. One each anti-K (Nas), anti-k (Ort); capillary papain. One each anti-Kp^a (97B) and anti-Kp^b + K (Raut); indirect Coombs.

The Duffy system. One anti-Fy^a (Rig) and one anti-Fy^b (Mul); indirect Coombs.

The Lewis system. One anti-Le^a (Mou); capillary.

Other systems. One anti-Wr^a (She); capillary at 37°. One each anti-Di^a (Woj), anti-Be^a, anti-By^a, anti-Yt^a (Cart); indirect Coombs.

Secretor status. Saliva samples were diluted one part to one part of saline, heated in a boiling water bath for 10 minutes, centrifuged and the supernatant tested, all of groups A, B and AB being tested for inhibition of anti-A, anti-B and anti-H; all of group O for inhibition of anti-H (Ulex). There were no discrepancies as between inhibition of anti-A or B and anti-H, while, since all proved to be secretors, the inhibition tests served to confirm the blood grouping.

RESULTS

The results are set out in table 1 to 9. The gene frequencies for the MN, Ss and Rh groups were determined by gene count, the others by square root methods or, as in the case of MNSs, by a combination. Those of group O who were P-negative were tested with anti-Tj^a and were positive. Hence, in that system, the frequencies are based on an assumed absence of *p*. Other than this the tables are self-explanatory.

[P.15]

128
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TABLE 1
The ABO system

Phenotype	Number	Frequency observed	Frequency expected	Number expected	Gene frequencies
O	146	0.4563	0.4583	146.66	*O* 0.6770
A_1	153	0.4781	0.4794	153.41	A_1 0.2914
B	14	0.0437	0.0438	14.02	*B* 0.0316
A_1B	7	0.0219	0.0184	5.89	
Totals	320	1.0000	0.9999	319.98	1.0000

TABLE 2
The MN system

Genotype	Number	Frequency observed	Frequency expected	Number expected	Gene frequencies
MM	221	0.6906	0.7092	226.94	*M* 0.8422
MN	97	0.3031	0.2659	85.09	*N* 0.1578
NN	2	0.0063	0.0249	7.97	
Totals	320	1.0000	1.0000	320.00	1.0000

TABLE 3
The Ss system

Genotype	Number	Frequency observed	Frequency expected	Number expected	Gene frequencies
SS	14	0.0437	0.0334	10.69	*S* 0.1827
Ss	89	0.2781	0.2987	95.58	*s* 0.1873
ss	217	0.6782	0.6679	213.73	
Totals	320	1.0000	1.0000	320.00	1.0000

TABLE 4
The MNSs system

Phenotype	Number observed	Frequency observed	Frequency expected	Number expected	Gene frequencies
MMSS	14	0.0437	0.0295	9.44	
MMSs	67	0.2094	0.2304	73.73	*MS* 0.1719
MMss	140	0.4375	0.4493	143.78	*Ms* 0.6703
MNSS	0	0.0000	0.0000	0.00	*NS* 0.0000
MNSs	22	0.0687	0.0543	17.38	*Ns* 0.1578
MNss	75	0.2344	0.2116	67.71	
NNSS	0	0.0000	0.0000	0.00	
NNSs	0	0.0000	0.0000	0.00	
NNss	2	0.0063	0.0249	7.97	
Totals	320	1.0000	1.0000	320.01	1.0000

TABLE 5
The P system

Phenotype	Number	Frequency	Gene frequencies
P+	107	0.3344	P_1 0.1842
P–	213	0.6656	P_2 0.8158
Total	320	1.0000	1.0000

27:Chown & Lewis 3-5 (1958) 1959 ND8 Copper Eskimo ND8

[P. 16, A]

128
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TABLE 6
The Rh system

Phenotype	Number	Frequency observed	Frequency expected	Number expected	Gene frequencies
CCDee	81	0.2531	0.2465	78.92	
ccDEE	78	0.2437	0.2407	77.02	
CcDEe	154	0.4813	0.4891	156.51	CDe(± Cde) 0.4695
CcDee	3	0.0094	0.0109	3.49	cDE(± cdE) 0.4906
ccDEe	4	0.0125	0.0103	3.30	cDe(± cde) 0.0109
ccdEe	0	0.0000	0.0001	0.03	
ccDee					
Totals	320	1.0000	0.9996	319.96	1.0000

TABLE 7
The Duffy system

Phenotype	Number	Frequency	Gene frequencies
Fy(a+)	300	0.9375	Fy^a 0.7500
Fy(a−)	20	0.0625	Fy^b 0.2500
Totals	320	1.0000	1.0000

TABLE 8
Other systems

System	Phenotype	Number tested	Frequency
Lutheran	Lu(a−b+)	148	1.00
Kell	K−k+Kp(a−b+)	320	1.00
Lewis	Le(a−)	320	1.00
Secretor	Secretor of appropriate A, B, or (and) H substance	300	1.00
	Tt(a+)	148	1.00

[P.16, B]

128
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TABLE 9
Antigens apparently lacking (i.e., not demonstrated)

System	Antigen	Number tested (all negative)
MNSs	He	[illegible]
	M^s	[illegible]
	Mi^s	[illegible]
	Vw	[illegible]
Rh	C^w	[illegible]
	V	[illegible]
Diego	Di^a	[illegible]
Berens	Be^a	[illegible]
Betty	By^a	[illegible]
Wright	Wr^a	[illegible]

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DISCUSSION

The gene frequencies of this population are in some ways similar to, and in others

27: Chown & Lewis B-6 (1958) 1988
ND8 Copper Eskimo ND8

[P 16, C]

143 different from, those of other Eskimo populations that have been studied. As to similarities there is, as in others, a low frequency of P_1, absence of K, of Le^a and of Di^a, and a high frequence of cDE. As to differences there are three of note. In the ABO system the frequency of B (0.0316) is low in comparison with that of the Eskimo of Alaska and southern Greenland, but is little if at all different from the frequency along the coast of Hudson Bay. In the Duffy system we proved by direct test the presence of Fy^b in the population and assume that it contains only the two Duffy genes Fy^a and Fy^b. On this basis the frequency of Fy^b is higher than in other populations we have tested. In the MNSs system the Copper Eskimo have the highest frequency of MS and the lowest Ns of any group we have examined. Judging by the following tentative frequencies there ap-

[P.17, A]

● 143 pears to be a cline from northwest to southeast, MS being replaced by Ns:

Population	MS	Ns	MS	Ns
Copper	0.1719	0.8703	0.0000	0.1578
West Hudson Bay	0.1534	0.8090	0.0000	0.2386
Baffin Island	0.1200	0.5843	0.0000	0.2857
Northeast Hudson Bay	0.1237	0.5846	0.0000	0.2017
Southeast Hudson Bay	0.0619	0.5602	0.0000	0.3719

114 The meaning of these differences is uncertain. The ABO findings taken alone
143 could be used as evidence supporting the
144 argument that the Eskimo living farthest south in Hudson Bay have a large admixture of Indian blood; indeed to the absurdity that they are pure blood Indians. But both the Duffy and the MNSs data destroy this argument. In point of fact so far as the MNSs data go the closer geographically the Eskimo come to the modern Indians the farther they recede from them genetically. It would seem to us that, as more complete blood groups and other genetic data accumulate, one can but conclude that there is no close genetic relationship between the Eskimo and the Indians of today. They may perhaps stem from a common stock, but if so the primary branching occurred a long, long time ago, while there has been little grafting since. Equally in our own studies there is surprisingly little evidence for replacement of Eskimo genes by genes of Whites. Such are present certainly, but not in such numbers in the populations we have studied as seriously to disturb the inherent Eskimo gene frequencies. If neither of these is the explanation of the variations then that explanation must lie within the Eskimo population itself.

114 The archaeologists have painstakingly de-
143 fined at least two Eskimo cultures in the
144 eastern Arctic, the Dorset and the Thule.
174 It would seem to us not unlikely that the people of these cultures differed genetically, perhaps as much as the Indians of today do from the Eskimo, and that there

[P.17, B]

114 may well be in the present Eskimo population a Dorset residuum which is genetically recognizable. It is hardly to be expected that such recognition will depend upon the presence of a strange gene in one population that is absent from the other, but rather upon differences of frequencies of genes already known or to be discovered, differences such as are indicated in the above data. One can as yet draw no firm conclusions, but certainly the indications are enough to make further genetic studies, even more complete than the present one, worth-while.

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SUMMARY

143 Blood group gene frequencies were determined based on samples from 320 Copper Eskimo as follows: *O*, 0.6770; *A*, 0.2914; *B*, 0.0316; *M*, 0.8422; *N*, 0.1578; *S*, 0.1827; *s*, 0.8173; *MS*, 0.1719; *Ms*, 0.6703, *NS*, 0.0000, *Ns*, 0.1578; P_1, 0.1842, P_2, 0.8158; *CDe*(±*Cde*), 0.4985; c*DE*(±*cdE*), 0.4906; *cDe*(±cde), 0.0109; Fy^a, 0.7500; Fy^b, 0.2500. The following phenotypes were found to have a frequency of 1.00; Lu (a − b +), K − k + Kp(a − b +), Le(a−) and Sec. The following antigens were not present in the population tested: He, M^g, Mi^a, Vw, C^w, V, Di^a, Be^a, By^a, and Wr^a. Differences between this population and other Eskimo populations studied were noted in the ABO, MNSs and Duffy systems.

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000 our stay at Coppermine comfortable and pleasant we are grateful to the Hudson's Bay Company and Factor C. Jones and Mr. Smith; and for helping us about our business, Cpl. D. McDougall and Mrs. McDougall, Father LaPointe and the Rev. Cannon Sperry.

ADDENDUM

124 Since this article was written we have
582 obtained additional genealogical information from Mr. Wm. Joss, Manager of the

144

144 RACIAL AFFINITIES--indicated affiliation with established races and subraces; supporting evidence; extent of race mixture; etc. See also:

Distribution of ethnic groups 182
Ethnic stratification and status of racial hybrids 563
Ideas about race 930

3: Rasmussen--72-75 (c. 1923) 1932 Copper Eskimo-1-2
116, 144, 174

"These [MPK: The Copper Eskimos] are the same Eskimos who a few years back suddenly became worldfamous under the name of 'the blond Eskimos'... [74, page 73 omitted] Vilhjálmur Stefánsson maintains that the distance between Greenland and Victoria Land is really so short that there would have been no practical difficulty in the Norsemen's migration to these regions. I can in no way agree with my highly esteemed colleague. The old Norsemen were mariners who penetrated far to the north in their boats, it is true; but they were in no way sledge travellers nor adapted to a winter culture such as that required in these lands. We lose the certain marks of their northern boundary in the rune-stone find at Upernivik, and though this of course does not mean that some hunters may not have forced Melville Bay, and that others may not have gone into Jones Sound, where Sverdrup considered he had found stone erections that resembled eider-duck traps, it has never been definitely proved, and the basis on which we have to build is all too slender. The regions in which the Norsemen lived had a subarctic climate, and there is no record of any kind that Eskimo sledge-driving was adopted by them. With no knowledge of the technique of arctic travelling, the distance between Greenland and Victoria Land grows great, and the fate of the many Northwest Passage expeditions shows better than anything else how impossible it would have been for Norsemen to navigate into these regions. And finally, if an immigration had meant so much that it could leave its mark upon the Eskimo population, there would have had to be more than an isolated ship that was beaten off her course--we must have a bigger immigration, and that can scarcely

have been at all possible. With all due respect to the courage of those old Norsemen and their ability to look after themselves, I do not think it would occur to them to carry wives and children into these parts.

Finally, in addition to these reasons we have the traditions. It would seem incredible that such a great event, even a thousand years later, should not be remembered by a people who so faithfully preserve all their old traditions. In Greenland, for instance, there are many legends of the Norsemen and their wars with the Eskimos. It would be natural to expect that something of the same sort would be the case among the inhabitants of Victoria Land.

And in fact all the anthropological measurements taken do not indicate any new infiltration in the tribe. All vital bodily and facial proportions are pronouncedly Eskimo, and nothing at all hints at any mixture of blood. In reality these blond types are not peculiar to Victoria Land either; on King William Land and Great Fish River, as well as among the Musk Ox people, I found types that [75] had just the same outer peculiarities--the same fair complexion, the reddish or brownish hair, the grey, often almost blue eyes, a surprisingly luxuriant beard--all otherwise unusual among the Eskimos. All these I found among other tribes who had no tradition of any intermingling, and who lived so far away from the Copper Eskimos that influence from these parts cannot be imagined. I am therefore convinced that these special types are due to purely biological conditions that are quite accidental, and defy the setting up of any rule."

7: Jennesa--46B (1914-16) 1923 Copper Eskimo
116, 144

"The description of the Copper Eskimos given in the last few pages might be applied in almost every detail to the Eskimos of other regions. Outwardly the natives of Coronation gulf can be distinguished from those of Alaska or of Hudson bay only by their style of clothing, by their manner of wearing the hair and tattooing the face, and by other features of an equally secondary character. Any physical peculiarities they may possess are relatively slight and can be established only by detailed measurements compared with the measurements of other Eskimo groups. In this way alone may we hope to discover whether the natives of Coronation gulf are to be classed as pure-blood Eskimos, or whether they show traces of foreign admixture."

7: Jenness--46B-B47 (1914-16) 1923 Copper Eskimo
116, 144

"The only foreign admixture that appears at all possible is with Indians. It is true that Mr. Stefansson though he could discern traces of European blood among the Copper Eskimos, and suggested as its only conceivable source the old Icelandic colonists in South Greenland.... His theory was based on certain supposed peculiarities in the length and colour of the hair, the colour of the eyes, and the general outlines of the features; and it was supplemented by a comparison of the proportion $\frac{\text{breadth of face}}{\text{breadth of head}}$ between the Copper and other Eskimos, a comparison which favoured, he thought, the hypothesis of their part-European descent. But the descriptions of the 126 natives from all parts of the Copper Eskimos region given in Section I of this paper show clearly that the theory has no foundation in actual fact. Not a single native there differs noticeably from the rest in colour and length of hair, while the blue or grey tinge of the eye, a peculiarity which is one of the cardinal points in Mr. Stefansson's theory and of which my tables give 16 instances, is not only pathological in origin, but common among Eskimos elsewhere. As for the general outlines of the features, I can merely remark that neither I myself nor any member of our party, during the two years we spent in this region, saw a single Copper Eskimo whose appearance suggested in the slightest degree the presence of European blood. The last [B47] of Mr. Stefansson's arguments, that derived from the proportion between the face breadth and head breadth, is purely illusory, as I shall show later on in the paper. Not one of the four features he cites,

therefore, lends the slightest support to his theory. Even on historical grounds.... [JMR: i.e. the theory that there are traces of European blood in the Copper Eskimo due to Scandinavian colonists in South Greenland] might reasonably be rejected, for while there is abundant evidence for movements of Eskimos from the west into Greenland, there is absolutely none for any movement from Greenland westward, at least not until the close of the nineteenth century. Any such migration as Mr. Stefansson postulates must have taken place after the middle of the 15th century and before the close of the 16th, which marked the opening of the great era of Arctic exploration; but a westward migration during these years is hardly conceivable, since this was the very period when the Eskimo tribes were working their way eastward into Greenland and establishing themselves along its coast-line."

7: Jenness--B47 (1914-16) 1923 Copper Eskimo
116, 144

"The theory of any European admixture among the Copper Eskimos may be rejected without further consideration. But the possibility of a slight infusion of Indian blood cannot be dismissed so summarily. It is true that from at least the middle of the 18th century until a very few years ago the two peoples studiously avoided each other, and the rare encounters of which we have any record were always hostile ones. Yet even during this period it is not impossible that young Indian girls were taken captive on a few occasions and married among the Eskimos. In the long centuries that preceded the historic period, centuries when the homes of many of the Eskimo tribes were certainly not the same as at present, it seems not unlikely that there were periods of peaceful intercourse and perhaps intermarriage between the two peoples. There are certain customs and beliefs common to them both that must surely have originated in a single source, and the very fact that Indians and Eskimos have blended on the lower Yukon makes it all the more probable that they have mixed elsewhere, though not to the same extent. We know that the Eskimos taken as a whole are not a homogeneous unit, for there are considerable differences in stature and in head and body proportions among the different tribes; but how far these differences can be co-ordinated with differences among adjacent Indian tribes we have yet to learn, since the northern Indians are even less known than the Eskimos. In fact, so scanty are our data concerning the physical characteristics of these Indians that in the ensuing discussion I shall lay very little

stress on their possible admixture with Eskimos, except in Alaska, but try merely to throw some light on the variations among the Eskimos themselves by relating the facts given in Section I of this monograph with what we already know of other tribes; and since the osteology of the western Eskimos is to be made the subject of a special report the present discussion will be confined mainly to observations on the living."

7: Jenness--B51 (1914-16) 1923 Copper Eskimo
116, 144

"The polygons below [AW: not reproduced] depict the statures in East Greenland (NE. and SE. Greenland combined), Coronation gulf and Point Barrow, the only places within the whole Eskimo area from which we have the data necessary for their construction. A glance shows that the polygons for East Greenland and for Coronation gulf are remarkably alike. The somewhat greater stature of the Coronation gulf women comes out very clearly, but, what the means failed to show us, the men also incline to be taller than their East Greenland kinsmen. Now the East Greenland natives are considered by Hansen to be a pure and unmixed Eskimo tribe. Are we then to attribute the slightly greater stature of the Coronation gulf natives to an infusion of Indian blood, as in the case of Alaska? It would seem that the resemblance between the stature polygons for Coronation gulf and East Greenland is so close that their slight differences in position might reasonably be ascribed to differences in the local conditions and modes of life, in which case, unless other evidence is forthcoming, any theory of Indian admixture is unnecessary. The increased height in Coronation gulf, however, need create no difficulty in our theory as to the effects of European and Indian contact on Eskimo stature."

7: Jenness--B65 (1914-16) 1923 Copper Eskimo
116, 144

"CONCLUSION

From the foregoing pages we may reap the following conclusions:--

1. There is some slight support for Hansen's view that European influence has produced a decrease in the stature of certain Eskimo tribes, but that its effect in other ways is indeterminate.

2. There is strong support for Boas' view that Indian admixture in Alaska has increased the stature and produced a marked tendency towards brachycephaly.

3. The Copper Eskimos show more resemblance to the eastern Eskimos than to the Alaskan.

4. The Copper Eskimo differ from most other Eskimos in that the head is slightly longer and broader, although the cephalic index is virtually the same as among the pure-blood tribes to the eastward.

5. There is no indication of European admixture among the Copper Eskimos, but a little evidence of slight Indian admixture."

9: Seltzer--354-358 (no date) 1933 Copper Eskimo-1-8
116, 144, 174

"Thus far those who have unearthed the archaeological data, those who have determined the ethnological material, those who have studied the geographical distribution of the Eskimo, have failed adequately to bring into relation their results with the available somatological data. In this paper I intend to correlate the physical evidence concerning the Eskimo with the known facts of material culture that have been eluci- [355] dated by such eminent authorities as Boas, Steensby, Rasmussen, Mathiassen, Birket-Smith and Jenness.

Many theories have been postulated for the origin of the Eskimo and the sequence of Eskimo cultures, but the most complete and comprehensive theory has been presented by Birket-Smith. (13) The various cultures in chronological sequence he gives as follows:

13. Birket-Smith, 1928 and 1929.

(1) Proto-Eskimo--a 'circumpolar ice-hunting culture' in the remote past, the Caribou Eskimos west of Hudson Bay being the last survivors.

(2) Palae-Eskimo--the bearers of this culture were once Proto-Eskimo but were the first group to adapt themselves to life at the sea, spreading all over the Arctic.

(3) Thule--corresponds to Steensby's Neo-Eskimo culture, (14) originating in the

14. Steensby, 1910.

west, most probably in Alaska, then spreading eastward to Greenland. The Thulers depended mainly on the hunting of whales.

(4) Eschato-Eskimo--represented by the Central Eskimo cultures. The bearers of this culture have fairly recently migrated north from inland.

In addition to the above we must add the as yet little known 'Bering Sea Culture' discovered in Alaska, which is considered by Jenness (15) to be older than the Thule.

15. Jenness, 1928.

Archaeologists and ethnologists are in complete agreement as to the existence of the Thule and the more recent Eschato-Eskimo cultures. But they disagree as to the Proto- and Palae-Eskimo cultures as expounded by Birket-Smith. For example, Mathiassen (16)

16. Mathiassen, 1930.

cannot find evidence for the presence of an older culture in the central regions than the Thule.

The question of the Proto- and Palae-Eskimos need not concern us at this point, but let us instead examine the somatological evidence for the Thule and Eschato-Eskimo cultures.

The Bearers of the Old Thule Culture

Mathiassen (17) has pointed out the fact that on the basis of various cultural evidences

17. Mathiassen, 1927.

it was apparent that the Thule culture originated in [356] western Alaska and from that focus spread eastwards right to Greenland. What were the physical characteristics of the bearers of this culture was not known, until fortunately, in 1918, Van Valin (18)

18. Hrdlička, 1930.

discovered a group of mounds near Point Barrow, Alaska, which contained a series of skeletal remains associated with artifacts of Thule type. That this culture belonged to the Thule people is a fact that has been adequately and conclusively demonstrated by Mason. (19) And further, that this was a historically ancient site is attested to by Van

19. Mason, 1928.

Valin, who on questioning the present inhabitants of Point Barrow, found that they had

no historical recollection of the existence of any previous group in this region, or that these mounds were actually 'Igloos.'

These important skeletons were measured in 1928 by Hrdlička (20) who came to the

20. Hrdlička, 1930.

conclusion that the bones of the Old Igloo Thulers were the remains of Eskimos whose physical type differed radically from groups now living in Alaska. On the basis of his report, the skeletal remains are distinguished by the great length and extreme narrowness of their skulls, with consequently low cranial indices, and also by their excessively high breadth-height indices. In short, the Old Igloo Thulers were described as a tall statured, dolichocephalic, orthocephalic, akrocephalic, hypsiconch, leptorrhine group.

These skeletons represent an individually characteristic and distinctive type which is clearly differentiated from almost all other Eskimo cranimetric series. They are distinguished from them in possessing the longest skulls, by far the narrowest skulls, the lowest cranial indices, the highest skull vaults, the highest cephalo-facial and breadth-height indices, and one of the tallest statures.

Do any of the existing Eskimo groups resemble this skeletal series by exhibiting similar characteristic features, or has this type entirely disappeared into the existing populations? A survey of the physical characteristics of the existing Eskimo tribes

brings to light the fact that of all the groups, the Mackenzie seem to fit this description best. We have seen, in previous pages, how the measurements and indices of this group stamped them apart from all the rest. These Mackenzie were described as the most Eskimoid of all the Eskimos. There was no group in the material studied that could lay claim to any close relationship with them whatsoever. The Mackenzie Eskimos were distinguished [357] from the other living groups in having the longest heads, the narrowest heads, the lowest cephalic indices, one of the highest cephalo-facial indices, and one of the tallest statures. Thus it may be seen that the Mackenzie Eskimos differ from the other living groups in the same characteristics and in the same direction as do the Old Igloo crania from the other Eskimo skeletal collections.

The fact that these two groups differ markedly from all the other groups in similar measurements and indices, in the same direction, and are both extreme types, leads one to suspect that they are of the same racial stock. Both are very long headed, both are very narrow headed, both have very low cranial indices, very high cephalo-facial indices, and tall statures.

Such close resemblances between two groups cannot be fortuitous, but on the other hand are a cogent argument for the postulation of racial identity, thereby confirming the conclusion that physically the Mackenzie Eskimos are the living descendants of the original bearers of the old Thule culture.

Are there any other Eskimos who resemble the Old Igloo Thulers in physical characteristics? From the geographical distribution of archaeological remains of the Thule type one would expect the Smith Sound, Baffin Land, Labrador and Greenland Eskimos to show close somatological likenesses with the Old Igloo people. Nevertheless, we do not find this condition, for the physical type has been changed, probably as the result of the penetration of newer peoples into these regions and the extinction of the Thulers.

Mason (21) has made the following statement:

> 21. Mason, 1928.
>
> it may now be stated that the bearers of the Thule Culture in Alaska were of a definite physical type and, according to Doctor Hrdlička, this type is identical with that of the present Eskimo of Southern Greenland and Labrador, and different from that of the modern Alaskan Eskimo.

I can find no evidence to substantiate this quotation in its entirety; in fact, all the material that we have, meager though it is, refutes some of these suppositions. The present Labrador Eskimos do not resemble the Old Igloo Thulers. The former have

shorter and wider heads, higher cephalic indices, longer faces, and much lower cephalo-facial indices. Most important of all is the fact that their statures are in no manner alike, the Labrador Eskimo being very short, having a mean [358] stature of about 157 cm., while the Old Igloo Thulers stand about 12.5 cm. taller, with a mean of 169.50 cm.

A study of the anthropometric data on the Greenland Eskimos does reveal some resemblances in physical features with the Thulers. Hrdlička, in 1929, emphasized a close connection between the Old Igloo skeletons and a series of undated crania from Greenland. In facial dimensions there appeared many 'striking similarities.' However, in regard to the proportions of the cranial vault these similarities were not so impressive. The mean difference between the two series for cranial length was 2.8 mm., cranial breadth 3.1 mm., cranial height 0.7 mm., cranial index 2.7, and for the height-breadth index 3.0 index units. These differences although not widely divergent are not small enough to presume physical identity, especially inasmuch as we are dealing with two series of the same racial grouping. Nevertheless, taking all the Greenland evidence as a whole, it may be stated that the Eskimos of that country have a basic strain of Thule blood which has been overlayed to a variable degree by a new infusion of a very short-statured, low-headed group, concerning which more will be said later.

Bessel's (22) measurements of a series of 100 Smith Sound crania would throw

22. Bessel, 1875.

considerable light upon the question of Thule inhabitants in that far north region, if the skulls had been sexed. Unfortunately, the unsexed data cannot be interpreted with any amount of confidence, so that we shall have to wait until this valuable collection is re-examined.

In summary of the existing knowledge concerning the bearers of the Thule Culture, we may say that the Mackenzie Eskimos are their only approximately pure living descendants, although traces of their blood can be found in other parts of the Arctic, particularly as a basic substratum in Greenland."

9: Seltzer--358-362 (no date) 1933 Copper Eskimo-1-6
116, 144, 174

"The present Central Eskimos, extending from Coronation Gulf to Baffin Land and Labrador, are the representatives of the modern Eschato-Eskimo culture. It is a commonly accepted proposition that this culture is later than that of the Thule, and that it appeared in its existing position only after the decline of the Thule Eskimos.

In support of this thesis, Mathiassen, Birket-Smith, Boas, Jenness and others have shown that in comparatively recent times there has been [359] a new advance of inland tribes from the region west of Hudson Bay to the Central Eskimo lands. This migration is supposed to have imposed upon the scattered remnants of the Old Thulers the new Eschato culture. Birket-Smith (23) has proven that the Caribou Eskimo have in historic

23. Birket-Smith, 1929.

times arrived at the Barren Grounds from inland regions, when the Chipewyan Indians retreated to the south. Jenness (24) came to the conclusion that the Copper Eskimos

24. Jenness, 1923 b.

were originally an inland people who have reached their present position within the last few hundred years.

Practically all of these hypotheses are based upon archeological and cultural data. The task for the physical anthropologist is to determine on the basis of somatological evidence, whether associated with this new advance of Eschato Culture, there has been a regular migration of new peoples or just an infiltration of cultural elements.

To Dr. H.L. Shapiro (25) must be given the credit for establishing for the first time

25. Shapiro, 1931.

a physical relationship between an interior Indian tribe and certain Eskimo groups. He sees close resemblances in physical features between the Chipewyan Indians on the one hand, and the Smith Sound, Coronation Gulf, and Seward Peninsula Eskimos on the other. In conclusion, Shaprio postulates that these Eskimos 'are derived from an Indian stock which migrated northward to the coast and then moved northeastward to Smith Sound and westward to Seward Peninsula.'

In Table 30, I have contrasted the pure Chipewyan Indian series measured by Grant with several Eskimo groups. An examination of the measurements and indices supports Shapiro's contention of a close physical relationship between the Chipewyan Indians and Seward Peninsula Eskimos, and, in my opinion, a more minute study would extend this relationship to include several other western Alaskan coast Eskimos, the Kotzebue Sound, St. Lawrence Island and Southwest Alaskans.

We can hardly question the striking likeness the Chipewyan Indians show with the Copper Eskimos. Yet, I feel that some distinction should be made between the Copper Eskimos of Coronation Gulf and those of Victoria Island. From the limited measurements we have, there is no doubt that the Victoria Island group is physically almost inseparable from the pure Chipewyan, the average differences between the means being only 0.94. On the other hand, the Coronation Gulf Eskimos [p. 360 contains a chart] [361] measured by Stefansson (26) and Jenness vary considerably from the Chipewyan,

26. This paper.

with average differences for the Stefansson series of 1.90 and 2.24 for those of Jenness. (27)

27. In comparing my Coronation Gulf Eskimos with those of Jenness it should be noted that under this heading Jenness has included 7 individuals from Prince Albert Sound and 34 from the southwest corner of Victoria Island, so that exactly half of Jenness' Coronation Gulf Eskimos would be according to my classification Victoria Islanders.

The Coronation Gulf and Victoria Island Eskimos are fundamentally one and the same

group of people with more or less identical culture, therefore, it is most probable that this physical difference between them can be accounted for on the basis of the greater assimilation by the Coronation Gulfers of a different racial strain. I maintain that this foreign blood was that of the Old Thulers.

It seems clear that when the Coronation Gulf Eskimos arrived at their present geographical position, they found some scattered remnants of the bearers of the Old Thule culture and it was with these Eskimos that they mixed. Although the Thulers were in all likelihood not very numerous, enough were absorbed to cause a change in the physical type of the invading group. The Victoria Island Eskimos retained more of their original physical characteristics, as shown by their shorter and wider heads and higher cephalic indices, because on entering their district they did not encounter as many of the older Thule inhabitants as did their more southern relatives. This theory is substantiated by the fact that archeologists have found more abundant Thule remains in the Coronation Gulf region than along the shores of Prince Albert Sound and Minto Inlet in Victoria Island.

In respect to the Smith Sound-Chipewyan relationship, the situation is not very clear. We are faced with an obstacle of generalizing from a series of 8 individuals. The average difference between their means has been calculated to be 2.29. This is not a small average difference, but still not excessively large. The difficulty arises in reconciling the exceedingly small stature of the Smith Sound Eskimos (157.4 cm.)

with the much taller Chipewyans who have a mean of 166.4 cm. This great stature difference of 9 cm., in my opinion, is sufficient grounds for calling in question the Chipewyan origin of the Smith Sound Eskimo.

On the other hand, it may be possible that the physical status of the Smith Sound group revolves about the historical migration of some [362] Pond's Inlet Eskimos into Smith Sound. The result of this new element was that the people measured by Steensby were a mixture of the indigenous population and the immigrants from the southwest.

Steensby (28) in describing these people writes: 'Those I met were on the whole small,

28. Steensby, 1910.

but there are not a few in the tribe who are above the average height. It is said that those who are descended from the Pond's Inlet Eskimos belong to the tallest in the tribe.'

This goes to prove that although the invaders were few in number, they undoubtedly altered to some extent the physical constitution of the residing group. Who the indigenous population of Smith Sound were, is a question which I shall discuss soon. Let it suffice for the present to state that unquestionably they were of very small stature.

To summarize the influence of the Athapaskans of Chipewyan stock we may conclude that:

9: Seltzer--358-362 (no date) 1933 Copper Eskimo-6
116, 144, 174

(1) The present inhabitants of the western coast of Alaska as far north as Point Hope, are the descendants of an invasion of people resembling the Athapaskans of Chipewyan stock. In this group we have the Eskimos from Kotzebue Sound, Seward Peninsula, St. Lawrence Island and Southwest Alaska.

(2) The Copper Eskimos are also related to the Athapaskan Chipewyans. The Coronation Gulfers are a mixture of the new invaders and the Old Thulers who still survived in that locality, while the Victoria Islanders retained their purity because of their being more or less out of the range of the Thule culture peoples.

(3) The Smith Sound Eskimos may be said to be very indirectly related to the Athapaskan Chipewyans, and that only if we infer that the Pond's Inlet immigrants were of Chipewyan-Eschato origin."

9: Seltzer--362-367 (no date) 1933 Copper Eskimo-1-7
116, 144, 174

"Another great division of the Eschato-Eskimo cultural advance is that participated in by the Central Eskimos in the region of Hudson Bay, including the intensively studied Caribou Eskimo, Netsilik and Iglulik groups.

In reference to the historical occupation by the Caribou Eskimo of their present territory, Birket-Smith (29) relates how the comparatively recent expansion of the

29. Birket-Smith, 1929.

Chipewyan Indians into the southern part of [363] the Barren Grounds exterminated 'an old offshoot of the Old Thule Culture.' The stimulus to this advance of the Athapaskans he charges to the introduction of firearms. The same authority also maintains that when the Chipewyans retired to the timber line, on the cessation of the pressure of the Crees from the south, the Caribou Eskimo took possession of the Barren Lands now left empty by the Chipewyans.

In addition, on purely cultural evidence, Birket-Smith (29) has propounded the theory that the present Caribou Eskimos are the last survivors of the Proto-Eskimo, a part of whom ventured to the coast in the region of Coronation Gulf and Bathurst Inlet, developed the Palae-Eskimo culture, and then spread eastward and westward along the coast.

There are two possibilities: (1) either we must accept Birket-Smith's point of view

9: Seltzer--360
116, 141, 144, 174

(no date) 1933

Copper Eskimo

"TABLE 30

Comparison Between Chipewyan Males and Western and Central Eskimos

No.	CHIPEWYAN PURE (44)	SOUTHWEST ALASKA (61)	ST. LAWRENCE ISLAND (63)	SEWARD PENINSULA (40)	KOTZEBUE SOUND (30)	VICTORIA ISLAND (36)	CORONATION GULF (65)	CORONATION GULF (62)	SMITH SOUND (8)
Measurements	Grant	Hrdlicka	Hrdlicka	Shapiro	Author	Author	Author	Jenness	Steensby
Head Length	193.5	192.9	193.3	196.3	192.50	194.13	196.71	196.9	196.25
Head Breadth	153.7	155.6	154.0	152.2	151.60	151.63	151.09	151.8	152.75
Cephalic Index	79.3	80.7	79.7	77.96	78.60	78.90	77.25	77.6	78.06
Face Height	125.3	126.7	126.8	126.9	127.73	125.20	127.73	124.9	125.38
Face Breadth	149.6	149.5	147.3	149.3	148.37	147.80	147.05	145.7	147.75
Facial Index	83.8	84.9	86.7	84.92	86.10	84.83	86.54	87.0	85.25
Cephalo-Facial Index	97.6	96.1	95.6	96.15	97.80	97.47	97.29	96.0	96.56
Stature	166.4	162.4	163.3	165.4	.....	.....	.....	164.8	157.4
Differences									
Head Length	193.5	—0.6	—0.2	1.8	—1.00	0.63	3.21	3.4	2.75
Head Breadth	153.7	1.9	0.3	—1.5	—2.10	—1.87	—1.61	—1.9	—0.95
Cephalic Index	79.3	1.4	0.4	—1.34	—0.70	—1.00	—2.04	—1.7	—1.24
Face Height	125.3	1.4	1.5	1.6	2.43	—0.10	2.42	1.6	—0.02
Face Breadth	149.6	—0.1	—2.3	—0.3	—1.23	—1.80	—2.55	—3.9	—1.85
Facial Index	83.8	1.1	2.9	1.12	2.30	1.03	2.74	3.2	1.45
Cephalo-Facial Index	97.6	—1.5	—2.0	0.55	0.20	—0.13	—0.31	—1.6	—1.04
Stature	166.4	—4.0	—3.1	—1.0	....	....	....	—1.6	9.00
Average Differences		1.50	1.59	1.15	1.44	0.94	1.90	2.24	2.28"

that the Caribou Eskimos are a very ancient group of survivors of the Proto-Eskimos, (2) or the Caribou Eskimos are not survivors of the Proto-Eskimo but are a new inland group which has come down to the coast as part of the late Eschato advance.

But before we consider this question let us determine the physical status of the Caribou Eskimo and demonstrate his affiliations.

In any event, whether or not Birket-Smith is right, one would expect to find on the basis of their inland origin, that the Hudson Bay Eskimos resemble an Indian stock physically. Fortunately, in the preliminary reports of the Fifth Thule Expedition. (30)

30. Birket-Smith, 1925.

there has been published a summary of a few of the measurements taken on Hudson Bay Eskimos. In Table 31 I have contrasted this series with a group of Algonkian Cree Indians measured by Grant at Fort Chipewyan.

The results are truly startling, for we do not find any large variations between any of the measurements or indices. Disregarding signs, the average difference is but 0.59. Both the Cree and the Hudson Bay Eskimos are characterized by mesocephaly tending towards dolichocephaly, fairly short and narrow faces and short stature. We cannot escape the conclusion that the Cree Indians and the Hudson Bay Eskimos are physically identical.

In addition, from the cultural point of view, the relation of the Caribou Eskimos to an Indian stock has been fully discussed by Birket-Smith, who derives most of the Indian cultural influences from the Algonkian Cree Indians. He says: (31)

31. Birket-Smith, 1929.

> [364] In now concluding the reference to the Indian elements in the culture of the Caribou Eskimos, there is reason for emphasizing once more, that in those cases where it was possible to trace them back to a particular tribe, it was to the Cree and not to the Chipewyan. (32) This quite conforms to the historical facts, as the

32. His italics, not mine.

> connection with the latter is scarcely 200 years old, whereas the intercourse with the Cree, now practically at an end, is much older.

Thus on the basis of both physical and cultural grounds, the Caribou Eskimos are unquestionably related to the Cree Indians.

The Caribou or Hudson Bay Eskimos do not possess, as regards physical make-up particular features which distinguish them from all of the other Eskimos and mark them out as being a separate and distinct type. On the contrary, they are but a single group of a certain type of Eskimo that is characterized by short stature, dolichocephaly bordering on mesocephaly, and fairly short and narrow faces. It is interesting to note at this point that they differ from those Eskimos related to the Athapaskan Chipewyans in having a much shorter stature, narrower head, slightly shorter heads, much narrower faces as well as shorter faces.

A survey of the existing Eskimo tribes shows that this type to which the Caribou Eskimos belong is also exemplified by the Labrador and Angmassalik Eskimos of East Greenland. In Table 32 I have tabulated the measurements and indices for these groups, and, although the Angmassalik series is not complete, lacking face height and facial index, it can be seen that they exhibit such close similarities to the others as to make the Hudson Bay, Labrador and Angmassalik Eskimos divisions of the same racial type.

Furthermore, an examination of the crania and long bones of the eastern Eskimo leads me to believe that before the inception of foreign white influence, that part of the Arctic from Hudson Bay to the east coast of Greenland was populated by this short-statured, almost mesocephalic, narrow-faced group.

We must not lose sight of the fact that this type was not the original Eskimo in these parts, but came later than the Thulers. In many localities these invaders encountered

scattered bands of the Old Thulers, some of whom were exterminated and others absorbed. This succession of the Thulers by the short-statured type is substantiated by numerous Tunit or Tornit legends, (33) which relate how the ancestors of the present

33. Hawkes, 1916.

[p. 365 contains a chart] [366] central and eastern Eskimos met and lived with a very tall statured Eskimo (Thulers), who were finally assimilated or destroyed.

I have shown, on the basis of somatological criteria, that the Hudson Bay Eskimos are undeniably related to a particular group of Cree Indians. I have also pointed out how the Hudson Bay, Labrador and Angmassalik Eskimos all belong to a single physical type. It follows, therefore, that this short-statured type of which the Hudson Bay tribes are members, is also closely affiliated with the Cree.

To emphasize this relationship, in Table 32, I have computed the average differences between the measurements and indices of the groups in question and the Algonkian Cree Indians studied at Fort Chipewyan. These differences are really so small as to warrant the presumption of close affinities with the Cree, and the conclusion that the short-statured dolichocephalic (almost mesocephalic) type, which spread over the whole eastern Arctic, was originally derived from an Indian stock resembling the Algonkian Cree.

If we now consider the question of the aboriginal population of Smith Sound we find more evidence available. From Steensby's data and from a study of the raw measurements of Bessel's unsexed crania, it seems most likely, that before the arrival of the Pond's Inlet immigrants the Smith Sounders were also of this short-statured dolicho type described above. The effect of the Pond's Inlet Eskimos was to increase the cranial and facial diameters of the original Smith Sound group. However, we cannot be absolutely certain of these facts until Bessel's series is sexed and re-examined.

In Greenland today, both the east and west coasts are racially so mixed that very few pure Eskimos are to be found. There is no doubt in my mind that the bearers of the Thule Culture arrived here, but not in any great numbers. The Eskimos who have maintained their purity up to the present, are usually of the short-statured dolicho group. Occasionally, we find among them a few tall individuals, who are probably descendants of the Old Thulers. We must also remember that Danish, Norwegian, German and other mixtures have been going on for many years. This white blood is altering the physical characteristics of the Greenland Eskimos who are beginning to evince taller statures, broader heads, much narrower and longer faces, with consequently low cephalo-facial indices.

If we return to the question of the Proto-Eskimo origin of the Caribou Eskimos as expounded by Birket-Smith, we find that on the [367] basis of physical evidence the

9: Seltzer--362-367 (no date) 1933 Copper Eskimo-7
116, 144, 174

Caribou Eskimos are related to the Algonkians of Cree stock. It has also been demonstrated that the Labrador and Angmassalik tribes are also affiliated with the same Indian group. It follows, therefore, that if we assume the Caribou Eskimo to be of Proto-Eskimo origin, then the Labrador and Angmassalik groups must have originated from the same stock. But since it is a well established fact that archaeologically the Thule Culture is the oldest in the eastern and central regions, the other cultures being superimposed upon it, then it would seem more probable that the Caribou Eskimo are not survivors of the Proto-Eskimo but rather a division of the late advance of the Eschato culture."

9: Seltzer--365 (no date) 1933 Copper Eskimo
116, 141, 144, 174

"TABLE 31

Comparison Between Means of Cree Indians at Fort Chipewyan and Hudson Bay Males

	CREE (Grant)	HUDSON BAY (Birket-Smith)	Diff.	
Head Length.....	193.2	193.7	0.5	
Head Breadth.....	150.0	149.7	—0.3	
Cephalic Index.....	77.6	77.3	—0.3	
Face Height.....	124.6	123.5	—1.1	Average
Face Breadth.....	144.6	143.4	—1.2	difference
Facial Index.....	86.1	86.0	—0.1	0.59
Cephalo-Facial Index....	96.6	95.8	—0.8	
Stature.....	161.0	160.6	—0.4"	

9: Seltzer--368 (no date) 1933 Copper Eskimo
116, 144, 174

"At a much later period [MPK: following the Thule Culture] allied with the Eschato Culture advance, there was a sudden Indianoid expansion from central Canada from about the region of Lake Athabaska. From this focus these migrations into the Eskimo regions, replacing and superimposing upon the earlier Thulers, emanated from two distinct sources. One group was derived from people of Athapaskan stock as represented by the modern Chipewyans, characterized by moderate height, mesocephaly, wide heads and fairly long and broad faces; the other was of Algonkian origin, as represented by the Cree, showing very short stature, dolichocephaly bordering on mesocephaly, quite short and narrow faces, with low cephalo-facial indices.

The 'Athapaskan Chipewyan' group traveled to the north and west, the western division occupying the region of Kotzebue Sound, Seward Peninsula and St. Lawrence Island, while the northern division, represented by the Copper Eskimos, migrated to the region of Coronation Gulf and Victoria Island.

The 'Algonkian Cree' stock sent their numbers to the north and east in successive waves of migration. The first group occupied the whole territory of Hudson Bay, Labrador, Baffin Land and Greenland, supplanting still existing bands of Old Thulers. The second group, represented by the present Caribou Eskimo, at a later period invaded the Barren Grounds where they are to be found today."

"To understand the historic possibility of European contact with the central Eskimo we must go back a thousand years in the History of the Scandinavian countries. Shortly before 870 A. D. Iceland was discovered by Norwegian navigators, and a few years earlier some Irish monks had occupied a small island just south of Iceland. The rapid settlement of Iceland was favored by the conditions of unrest in Scandinavia, connected with the wars of conquest waged by Harald, who was making himself the first king of united Norway, and driving out the petty kings who formerly had been independent rulers of separate territories, and who now generally preferred exile to allegiance to Harald. As is well known, some of these went to France, where they became the Normans who conquered England. Others went directly to England, and established there the kingdom of Northumbria. War expeditions on a smaller scale got them footing in other parts of the British Isles, in the Orkneys, the Shetland, and the Faroe Islands. But perhaps the largest number of all were those who colonized Iceland, where the first settlement is considered to have been made in 872. Within a century from that time the entire coast line was peopled with seafaring men who spent their summers in piracy along the various shores of northern Europe, and returned to Iceland in the fall to spend the winter in the enjoyment of the fruits of their plundering.

Early in the last quarter of the tenth century a man named Eric [196] the Red was outlawed from Norway for murder. He came to Iceland and settled there, but the habit of man-killing was too strong upon him, and in 982 he was outlawed from Iceland for a

period of three years. At that time there was current in Iceland a belief that a certain sailor named Gunnbjorn, of whom little is otherwise known, had sailed to the west of Iceland, and seen there some reefs, on which he had not landed. The knowledge of this tradition, combined no doubt with the fear of returning to the Scandinavian countries where he would have been an unwelcome visitor, caused Eric at the beginning of his exile to sail west, to become the discoverer of Greenland, whose glacier-covered mountains rise from the sea before the peaks of Iceland disappear in the east. Like the navigators of the present day, Eric found the east coast blockaded with floes, so he sailed to the south around Cape Farewell, and landed upon the more inviting southwest coast, where he spent the three years of his exile. On his return to Iceland he gave a favorable account of the country, which he had named 'Greenland,' for, as the saga naïvely says, 'he thought people would all the more desire to settle the country if it had a fair name.' Eric advertised his discoveries with such success that in 985 a fleet of twenty-five vessels sailed from the west coast of Iceland for Greenland. Some of these were shipwrecked, some turned back, but fourteen reached their destination. There is no census of the original settlers, but it is probable that each ship carried not less than fifty people, and the number can therefore be safely put at from six hundred to seven hundred. Each ship carried all the household goods of the owners, including horses, cattle, and sheep, and a flourishing farming community soon sprang up.

One of the important results of the settlement of Greenland was the discovery of the mainland of North America. Leifr Eiriksson, the son of Eric the Red, sailed in the year 1000 from Norway to visit his father in Greenland. This was in the days before exact navigation, and in trying to find a direct route he sailed too far south, missed the point of Greenland, and saw land for the first time in a much lower latitude than he had expected, where natural conditions showed him at once that he had struck another coast than that of Greenland. This was the first fully authenticated discovery of [197] America and the story of his epoch-making voyage is therefore so well known that we shall not dwell upon it here. He returned the same summer to Greenland, and told the story of his discovery, which then spread to Iceland and the rest of Europe, and found lodgment not only in the minds of men, but also in documents in various parts of Europe.

About the year 1000 Christianity was brought to Greenland, and from that time on we find records of the colony, not only in the sagas and annals of Iceland, but also in the archives of the Holy See in Rome. By the twelfth century there were in Greenland a bishopric, two monasteries, a nunnery, and fourteen churches. The colony was in a flourishing condition, and cannot have had a population of less than three thousand; the actual number may have been considerably more than that. They regularly paid their tithes to Rome, and we have papal records of the fact that in 1347 they even contributed in walrus ivory to the Crusades and to a Norwegian war expedition against Russia. The trade of the country was mostly with Norway, and besides ivory their exports were hides

11: Stefansson--173 (1908-1912) 1913 Copper Eskimo
116, 144, 177

"These simple, well-bred, and hospitable people were the savages whom we had come so far to see. That evening they saw for the first time the lighting of a sulphur match; the next day I showed them the greater marvels of my rifle; it was a day later still that they first understood that I was one of the white men of whom they had heard from other tribes, under the name kablunat.

I asked them: 'Couldn't you tell by my blue eyes and the color of my beard?'

'But we didn't know,' they answered, 'what sort of complexions the kablunat have. Besides, our next neighbors north have eyes and beards like yours.' That was how they first told us of the people whose discovery has brought up such important biological and historical problems, the people who have since become known to newspaper readers as the 'Blond Eskimo.'"

and thongs, oil, butter, wool, and other products of the farm. At first the Greenlanders used to sail their own vessels, and we have records of their making triangular voyages, going first from Greenland to the mainland of America to take on cargoes of timber, taking these thence to Iceland to sell them for house-building purposes, taking Icelandic wares in exchange, and returning with them to Greenland. Later on, however, bad times came upon the colony through establishment of a trade monopoly by the Norwegian king, who in 1294 sold to a single firm of merchants in Bergen the exclusive right of trading with Greenland, and made it a statutory crime for the Greenlanders to build or sail their own ships, or to deal with any one not connected with this firm. In consequence the trade with Europe, which had been fairly brisk up to this time, gradually dwindled so that toward the end of the fourteenth century it was often several years between the sailings of ships to Greenland.

When the Scandinavians first settled southwest Greenland they found there house ruins and other remains which indicated that Eskimo had visited the country before its settlement. For some reason, however, these Eskimo had left the country again, and the [198] Scandinavians came in no contact with them during the early period of the colony. About the middle of the thirteenth century, however, they began to crowd down upon the colony from the north, apparently having come from the American continent by way of the Arctic islands, crossing thence to Greenland by way of Smith Sound. We have several accounts of the earlier fights between the Scandinavian and the Eskimo, and we know

definitely that shortly after the year 1341 the most northerly Scandinavian colony was destroyed. The last reliable accounts of the southern portion of the Scandinavian settlement date from the first years of the fifteenth century, although more doubtful accounts take this story nearly down to the year 1500. At the time that Columbus sailed for America a bishop appointed by the Pope still had the nominal office of 'Bishop of Greenland,' although he never left Europe to assume his actual duties in the West.

It was a combination of circumstances that finally cut off all communication between Bergen and Greenland. The paralysis that fell upon Europe as a consequence of the Black Death was one of the influences; raids upon Bergen by ships of the Hanseatic League was another. When communications with Greenland were resumed, Norway had lost her lead in maritime affairs, and it was the sailors of England who rediscovered the country. In 1585 John Davis sailed up into the strait which bears his name, and the navigators that followed him brought to the attention of Europe the Eskimo, who were by that time the sole inhabitants of the districts in which the Scandinavian colony had previously flourished. It cannot have been much more than a hundred years from the disappearance of the Scandinavians from Greenland to the coming of Davis, and it is certain that had the people of that time taken the scientific interest that modern explorers do in the things they saw and heard, they could have cleared up the mystery which still envelops the fate of the colony. Historians have always considered it probable that it was no war of extermination that ended the Norse occupation, but that one of two

things happened: either the remnants of Europeans may have intermarried with the Eskimo in Greenland, or, more probably, they may have migrated westward to the portions of America so well known to their forefathers. In [199] America they either perished through starvation or by war, or became amalgamated with the population which they found in the country.

Shortly after the announcement last fall of our discovery of European-like people in southwest Victoria Island, General A. W. Greely undertook a survey of the entire mass of Arctic literature with the view of finding references to previous discoveries of a similar nature by the early voyagers. His thorough familiarity with the printed sources, and the possession of manuscript documents of great value, enabled him to bring together many things which had previously escaped notice, but which established a fairly complete historical chain of references to 'Blond Eskimo' from the time of Davis to the present. The first, and perhaps the most interesting, reference is that to Nicolas Tunes, captain of a fishing vessel, who in 1656 sailed up into Davis Strait to 72° north latitude. He found the district which he visited occupied by two different sorts of people. He saw one kind which he described as very tall, well built, of a rather fair complexion, swift on foot; the other was much smaller, with an olive complexion, and short, thick legs. The latter of these types is easily recognized as the Eskimo, while the former would fit well a people of mixed Scandinavian and Eskimo descent, in whom the Scandinavian was the predominating element. Coming to more recent times and to more

westerly districts, we find on the road which any migrating people must have travelled between Greenland and Victoria Island numerous references by explorers at various times to people whom they did not consider to be typical Eskimo. Sir John Franklin, who was the first of the explorers to approach the region in which the European-like Eskimo now live, came in contact in 1824 with just one Eskimo, a decrepit old man, abandoned by his companions, who had fled at the approach of the exploring party. Of him Franklin says:

'The countenance [of this man] was oval, with a sufficiently prominent nose, and had nothing very different from a European face, except in the smallness of his eyes and, perhaps, in the narrowness of his forehead. His complexion was very fresh and red, and he had a longer beard that I have hitherto seen on any of the aborigines of America.' [200]

In the same district in 1837 Dease and Simpson came in contact with a small party of Eskimo, one of whom they described as of 'a distinguished appearance,' and as looking 'much like a Scandinavian.'

There is no reason for insisting now or ever that the 'Blond Eskimo' of Victoria Island are descended from the Scandinavian colonists of Greenland, but looking at it historically or geographically there is no reason why they might not be. We have seen that the Scandinavians flourished for centuries on the west coast of Greenland. We know that at the time when communications between Europe and Greenland were cut off there were still large numbers of them living in Greenland in proximity to the Eskimo. We know that the habits of the Eskimo are such, as exemplified in their relations with the

American Indian and the white man in recent times, that they are inclined to mix with any race with which they come in contact. Greenland is not far from Victoria Island. If there were any reason for doing so, I could go by sled in less than twenty-four months from the southwest corner of Victoria Island, where the 'Blond Eskimo' now live, by way of Smith Sound, to the districts in Greenland which the Scandinavians inhabited, or by crossing from Greenland in a boat in summer I could go in one year thence by sled west to Victoria Island. As a matter of fact, the Eskimo who now winter on the ice west of Victoria Island start thence in March, and by August meet for trading purposes the Eskimo of the Hudson Bay, just above Chesterfield Inlet. There is, then, no more reason geographically than there is historically to suppose any barrier that could have kept the Scandinavians from moving west to Victoria Island had they wanted to.

If the reason that the Victoria Island Eskimo are European-like is that they are of European blood, then the Scandinavian colony in Greenland furnishes not only an explanation, but the only explanation. It has been suggested in print that there may be some connection between these blond tribes and the English explorers of the Arctic Islands. A sufficient lack of information might make this supposition seem probable. It is true, however, that the literature of the Franklin expeditions not only is fairly complete, but also that the Eskimo themselves still remember such contact as they had [20] with the explorers. Of all tribes visited by us only three were shown by our literature to have come in contact with the explorers, and in all these tribes I found men still living who

remembered the incident. The extracts already quoted show that when the first Englishmen came in contact with these people, they found already among them exactly the same blond traits that we find to-day, and secondly, the amount of contact was so slight that no physical change of whole tribes could have been produced. Had Franklin's entire ship's company of two hundred and thirty men survived in Victoria Island, and had they all married among and lived among the Eskimo, their descendants could not have been numerous enough to give us the condition we find there to-day. We have records, however, of the actual death of more than half of Franklin's men, and we feel certain that they had all perished before the year 1860 at the latest.

It is over a hundred years since the Eskimo of Western Alaska came in contact with the early Russians. For a half a century they have been in contact with the American whaling fleet, numbering at times as many as a thousand men. A good many of these whalers have married Eskimo women and have settled in the country, and their grandchildren are already growing into man's estate; yet all this mixing of races had produced in northern Alaska no such blond type as we find in Victoria Island. There are living in northern Alaska and the Mackenzie district perhaps a hundred individuals of mixed European and Eskimo descent. If this hundred were gathered together in one place, it would be found that many of them could not be distinguished offhand from full-blooded Eskimo, and the group as a whole would by no means present north-European an

appearance as would any of the three tribes in southwest Victoria Island. And then it is to be noted that if recent admixture of European blood were the cause of the blondness of the Victoria Island Eskimo, you would expect to find more blondness the farther east you go, because the European contact would have to be supposed to have come from the direction of Hudson Bay. The fact is, however, that the blond type is most pronounced farthest west, and gradually fades the farther east you go toward Hudson Bay. I have not myself seen the Eskimo of Hudson Bay, who have for more than a century been in contact with the Scotch and American whalers; but Captain [202] George Comer, of East Haddam, Connecticut, who has had dealings with them continuously for more than a quarter of a century, has told me that such European-like appearance of the people as I have described for Victoria Island and as my photographs show is quite beyond anything he has seen before even in those tribes which have been most intimately connected with the whalers.

As for the contact of the Victoria Island Eskimo with the American whalers, there is little to be said. Only one out of the thirteen tribes visited by my party had ever been seen by whalers, and they were first seen by the schooner Olga in 1906, when she wintered behind Bell Island near the southwest corner of Victoria Island. They were re-visited by the Olga in 1908, but by no other ship, and the total contact of the

Olga's crew with the people did not amount to a whole week of continuous association.

Apart from the historical explanation, there are, of course, purely biological ones. It is possible that for some so-called 'accidental' reason blond individuals may have been born from time to time in the past from parents of pure Eskimo blood, and that these may have perpetuated themselves. As to supposing that it is the climate that has made the Victoria Island Eskimo blond, the theory would be hardly tenable, for they live on the same food and under the same climatic conditions as do the Eskimo east of them and west of them, none of whom show the same European-like traits."

11: Stefansson--288 (1908-1912) 1913 Copper Eskimo
144

"The Prince Albert Sound People never heard from the Ekalluktogmiut whom they see most summers, of ships being lost [Franklin's] or of white men starving on the east coast of Victoria Island. (Pamiungittok's son, Kitirkulak, will make inquires for me next summer of the Ekalluktogmiut [with regard to the loss of Franklin's ships].) He has never heard of any white men having Eskimo wives [or living in any part of Victoria Island--this question I asked with reference to the blond traits of many members of this tribe]. It is 'in the nature of Eskimo to have light hair and blue eyes' [he told me, and all his countrymen agreed with him]."

"THE 'BLOND' ESKIMOS
By DIAMOND JENNESS

INTENSE interest was aroused in the scientific world when Mr. Stefánsson announced his discovery of 'blond' Eskimos in Victoria Island, and suggested that here in this remote corner of the Arctic we might find traces of the old Norse settlers who disappeared from Greenland in the course of the fifteenth century. General Greely at once made a comprehensive survey of all the literature dealing with the Eskimos, and published in the National Geographic Magazine an interesting compilation of the remarks of earlier writers on the varying physical types that are found among that people. (1) Several travellers had noticed individuals who markedly resembled Indians; Collinson had observed aquiline noses and a Jewish caste of countenance in Walker Bay, in Victoria Island, and Murdoch had noticed the same thing at Point Barrow, in Alaska; Petitot had seen a Scotch- or Russian-looking individual in the Mackenzie River region, while one or two other travellers elsewhere had observed Scandinavian types. These variations were noticed all the way from Greenland to Alaska, and as far south as Labrador; for to the authors quoted by General Greely we have to add, besides Murdoch to whom we have already referred, the old Jesuit missionary Père Lafitau, who says of

"1. National Geographic Magazine, 1912, pp. 1225-1239."

the Labrador Eskimos, 'They are tall, well built, and whiter than other savages. They allow their beards to grow, and have curly hair which they cut below the ears. Their hair is almost always black, [258] but a few have light-colored hair (Fr. blonds), and some red hair (Fr. roux), like the people of Northern Europe.' (1)

Mr. Stefánsson first encountered the Copper Eskimos at Cape Bexley, in Dolphin and Union Strait. Even there, he says, he had noticed a certain peculiarity in some of the natives, a certain lightness in the color of the moustache and beard that he had never observed farther west. But it was only when he crossed the strait and met the Hanerak and Puivlik groups of southwestern Victoria Island that he became fully conscious of the change. 'We had been told by our guide,' he says, 'that we should find the Victoria Islanders of a light complexion, with fair beards, but still we were not prepared for what we saw.... Here (in Victoria Island) are men with abundant three-inch-long beards, a light brown in their outer parts, but darker towards the middle of the chin. The faces and proportions of the body remind of "stocky," sunburned, but naturally fair Scandinavians.' Mr. Stefánsson finally sums up the physical characteristics of the Copper Eskimos as follows: 'Of something less than a thousand persons, ten or more have blue eyes ... some of them eradicate their beards ... but of those who have beards

"1. Moeurs des sauvages ameriquains, par le Père Lafitau, de la Compagnie de Jésus, Paris, 1724, vol. I, p. 55f."

a good many have light brown ones; no one seen has light hair of the golden Scandinavian type, but some have dark-brown and rusty-red hair, the redness being usually more pronounced on the forehead than on the back of the head, and perhaps half the entire population have eyebrows ranging from a dark brown to a light brown or nearly white. A few have curly hair.' Mr. Stefánsson then compares the form of head of the Copper Eskimos with that of the Eskimos in other regions, and comes to the conclusion, (1) that the Copper Eskimos show clear evidences of hybridism, and (2) that their European-like appearance is most easily explained by the theory that they have European blood in their veins, for which the old Scandinavian colony in Greenland furnishes the only explanation. (2)

The southern party of the Canadian Arctic Expedition, of [259] which I was the ethnologist, had its head-quarters at Bernard Harbor, on the mainland side of Dolphin and Union Strait, from 1914 to 1916. During two entire years we maintained an almost unbroken intercourse with the Eskimo inhabitants both of the mainland and of southern Victoria Island, from Cape Bexley at the west end of Dolphin and Union Strait, to Bathurst Inlet at the east end of Coronation Gulf; in addition we encountered a few natives, six adults and two children, from Prince Albert Sound, on the west coast of Victoria Island. Physical measurements were taken of 82 men and 42 women, and at

"2. My Life with the Eskimo, p. 192ff."

the same time observations were made concerning their eyes and hair and other external features. In summarizing the results, in so far as they bear on the question of the 'blondness' of these Eskimos and the possible infusion of European blood, I have not considered it necessary to separate the Victoria Islanders from the natives of the mainland south of them (although it might easily have been done), because all the tribes in this region constantly intermarry, and in any one group representatives may be found of half a dozen different tribes, both from the mainland and from Victoria Island.

Of the 82 males that were measured 70 had eyes that ranged in color from light brown to dark brown. In the remaining 14 the predominating color was brown, but it was tinged with grey (in one case a greenish-grey) or a milky blue. Closer examination showed that this second color was usually present only on the fringe of the iris, often only on the lower or the upper edge, and that it extended occasionally into the sclerotis; very rarely did it cover the whole of the iris. Of the women only two out of the 42 showed bluish or greyish tinge, the remainder all having brown eyes. (1)

"1. The color of the iris among the total number of East Greenlanders examined (136) must be designated as brown with certain nuances; blackish-brown, dark-brown, greyish-brown-- with only a single exception, a twenty-year old girl from Umanak, who had blue eyes.' (Meddelelser om Grønland, vol. XXXIX, p. 177.)"

18: Jenness--257-267 (No date) 1921 Copper Eskimo-5
116, 144

It is a significant fact that in every one of the 16 cases of light-colored eyes the native was either middle-aged or well advanced in years; the youngest could hardly have been less than 35 years of age, and the majority were probably 40 to 50. Apparently, [260] therefore, it is very rare in children. Further, the light coloration was sometimes more marked in one eye than in the other. It seems reasonable to suppose, therefore, that it is only a secondary characteristic, indicating probably a diseased condition. Dr. D. S. Neumann, the health officer of the Bureau of Education in northern Alaska, thought that it might be due to repeated attacks of snow-blindness, when it would naturally be more apparent in the older people, and among the men more than among the women. He kindly examined with me a number of Eskimos from the King and the Diomede Islands, and from Cape Prince of Wales, who happened to be in Nome at the time of my visit. The results were very instructive. Out of 67 natives, adults and children, only two were found to be absolutely free from any eye disease. Ten out of 13 King Islanders showed arcus senilis to a greater or less extent, and one rupture of the eyeball. Of 14 Diomede Islanders 10 had arcus senilis, 3 the same disease combined with pterygium, and1 rupture of the eyeball; while out of 40 Cape Prince of Wales natives 21 had arcus senilis, 14 both arcus senilis and pterygium, 3 keratits and arcus senilis, and two granulated lids. It required careful examination in many instances to detect the signs of disease, but wherever arcus senilis was very pronounced there was

the same bluish-grey coloration of the eye as I had noticed among the Copper Eskimos. It may be that future researches will show other causes for the variations in eye color; nevertheless the fact remains, that as far as my own observations enabled me to judge, the eyes of the Copper Eskimos differed in no respect from those of the natives in northern Alaska.

Although no correlation can be expected between the color of the eye and its shape, yet it is interesting to notice that there was the same variation in shape among the 16 light-eyed Copper Eskimos as among the other natives of their race. Two of the 14 men had perfectly 'straight' eyes, while the remaining 12 showed the 'Mongolian' fold to a greater or less extent. In one of the women the fold was strongly marked. Every variety of shape is found indeed among all the tribes of Eskimos, from full 'Mongolian' to full 'European,' though the 'half-Mongolian,' i. e., the slight fold, is [261] perhaps the commonest type. We made no attempt to measure little children among the Copper Eskimos, but all whom I saw seemed to have very dark brown eyes with the 'Mongolian' curve more pronounced than in the case of the adults; Parry, it may be mentioned, noticed the same difference between children and adults among the Igluik Eskimos of Baffin Land. (1)

"1. Parry, Voyages, vol. IV, p. 78, 1835."

The next point to be considered is the color and shape of the hair. It is important to distinguish first of all between the hair of the head, the eyebrows, the moustache, and the beard. Among several races, including Europeans, it is usual for the moustache and beard to be a little lighter in color than the hair of the head. In the case of the 124 Copper Eskimos whom I measured, the hair of the head was uniformly some shade of black or brownish-black. In a dull light, except on the most careful examination, it would have passed as black in almost every case; but against a strong light a dark brown tinge was usually noticeable, especially at the ends of the hair. Its shape was seldom absolutely straight and lank; there were usually slight ripples in it, especially toward the ends. It might almost have been called 'wavy' hair in one or two instances if the term 'wavy' had not been technically applied to the much finer and more billowy hair of Europeans. I noticed that in many cases the hair seemed to begin a little farther back on the forehead than is uaual, giving an unreal appearance of height to the forehead; but there was no change of color in this part of the head that I could perceive. As for the glossiness remarked by earlier writers as so typical of Eskimo hair, it seemed to vary considerably from individual to individual. (2)

"2. In East Greenland the color of the hair is black or dark-brown (Meddl. om Gron., vol. XXXIX, p. 177."

The eyebrows were in most cases very sparse so that it was difficult to detect their real color; but in no one of the 124 cases that we examined were they lighter than a dark brown, save where they were becoming grey with old age. Neither the moustache nor the beard was ever thick or abundant, not [sic] did they attain to any great length. I can not help thinking that Back exaggerated somewhat when he said of the Eskimos on the Great Fish River that [262] 'they could not have nurtured a more luxurious growth of beard, or cultivated more flowing moustaches.' Certainly this was never the case among the Copper Eskimos we encountered, with whom neither the moustache nor the beard ever developed to any extent until they approach middle age; indeed the presence of a beard was considered by them as a certain sign of old age, or at least of advanced years. It is generally concentrated on the chin, with only a few sparse hairs scattered over the jowls; three inches would probably be the maximum length. In color it is usually a dark brownish-black, but not infrequently it is a rich brown, especially around the lips. Even in such cases, however, the hair on the chin is almost always a brownish-black, except when it is becoming grey with old age. There is some reason, therefore, to suspect that any unusually light color around the lips is due to some bleaching agent, perhaps the hot blood soup that the natives are always drinking; for in no case that we noticed was the hair of the head other than black, or a dark brownish-black.

The color of the skin ranged from a fairness almost as great as that of the average

Englishman, to the olive color of the Italian. Murdoch found the same differences at Point Barrow, in northern Alaska. He says, ' There appears to be much natural variation in the complexion, some women being nearly as fair as Europeans, while other individuals seem to have naturally a copper color.' (1) I compared my upper arm with the upper arms of a number of Copper Eskimos, and in some cases there was hardly any perceptible difference. Those portions of the skin, however, that are exposed to the weather, the face and the hands, tan to a darker color than the corresponding portions in Europeans, and this natural dark hue is increased in summer by an incrustation of dirt, for the natives practically never wash. Hence the traveller who judged of the color of the Eskimos by their complexion in winter would come to the conclusion that they are fair-skinned people, while another who saw them only in the summer would believe them to be as dark as Spaniards or even darker. There [263] is one point, however, that it is important to notice, and that is that there appears to be no connection whatever between the fairer skin color of some of the natives and blue or grey eyes.

Mr. Stefánsson gave some figures showing the proportion between the breadth of the head among the Copper Eskimos, and compared them with some figures that the veteran

"1. Ann. Rep. B.A.E., vol. 9, p. 36; cf. Simpson, Arctic Papers for the Expedition of 1875, p. 238, London, 1875.

anthropologist Dr. Boas had published from other Eskimos. (1) It is unfortunate that these particular measurements should have been chosen for comparison, for they are not the standard ones that are usually made by anthropologists in questions relating to race. Moreover most of the figures that are quoted from Dr. Boas are derived from skull measurements, and so are not strictly comparable with measurements derived from living natives; then again they are derived from a very limited number of skulls, and so can not be relied upon as establishing definite types. Three Mackenzie River Eskimo men whom I measured gave results that were practically identical with the measurements of the 82 Copper Eskimo men, which is totally at variance with Mr. Stefánsson's conclusions. (2) But until more measurements of this kind are published

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"1. Bulletin of the American Museum of Natural History, vol. XIV, 1901, p. 60.

2. The three Mackenzie River men gave an index of 95.6, and the 82 Copper Eskimos 96. Three Alaskan natives from Point Hope gave an index of 99.1."

from other sources no real comparisons can be made on this basis between the different tribes of Eskimos," and certainly no conclusions can be drawn from them concerning the purity or otherwise of any particular branch of that race.

The best indications in regard to race, as far as physical measurements are concerned, are derived , according to the opinions of the leading anthropologists,from the stature, and the proportions of the length of the head to its breadth, i. e., the cephalic index. Now in selecting other Eskimo groups for comparison with the Copper Eskimos we ought to choose those which are admittedly the purest, and at the same time those from whom we have considerable amount of reliable anthropometric data. There is really only one group which answers to these two requirements, the Ammassalik Eskimos of East Greenland, who are regarded by Søren [264] Hansen, our chief authority, as 'a pure and unmixed Eskimo tribe without any ostensible traces of foreign elements.' (1) If, then, we compare the measurements obtained from the Copper Eskimos with the corresponding measurements obtained from East Greenland, we ought to be able to obtain some light on the purity or otherwise of the former people.

Taking the stature first, Hansen found that in East Greenland, the average height of 53 men was 1629 mm. (maximum 1760 mm. minimum 1486.) and of 38 women 1538 mm.

"1. Meddelelser om Grønland, vol XXXIX, p. 179."

(maximum 1650 mm., minimum 1430 mm.). My figures for 82 Copper Eskimo men gave an average of 1648 mm. (max. 1743 mm., min. 1495 mm.) and for 42 women 1564 mm. (max. 1660 mm., min. 1471.). It would appear, therefore, that on the average the stature of the Copper Eskimos, both males and females, is very slightly greater than that of the East Greenland natives. The difference is so little, however, that, if significant at all, it could very easily be accounted for by the different conditions of life in the two regions. As far as the stature is concerned, therefore, we have no evidence of Scandinavian admixture among the Copper Eskimos. Indeed, the evidence we have might almost be said to point against it, for in southwestern Greenland, where there ha has been admittedly a considerable admixture of Danish blood, the average height of 21 men (Hansen's figures again) was only 1576 mm. (max. 1684 mm., min. 1520 mm.) and of 24 females only 1518 mm. (max. 1602 mm., min. 1452 mm.); that is to say, in southwestern Greenland, where there is Scandinavian infusion, the stature is slightly below that of the pure-blood East Greenlanders, whereas among the Copper Eskimos it is slightly above. (2)

"2. 13 Eskimo men of Point Hope, in northern Alaska, gave an average stature of 1673 mm."

Let us consider next the cephalic indices of the Copper Eskimos (breadth of the head as compared with its length), and compare them with Hansen's figures from East Greenland. Here we find a very marked resemblance. The average cephalic index of the 82 Copper Eskimo men was 77.6, and of the 42 women 76.7, whereas in East Greenland Holm's figures, as given by Hansen, are 76.9 for [265] 53 men and 75.6 for 38 women. The differences in the figures are so slight as to be practically negligible; they might, indeed, almost disappear if we had a greater number of cases to go by. Certainly in themselves they lend no support to any theory of race intermixture for the Copper Eskimos which would not be equally true of the natives of East Greenland. (1)

It is quite possible, however, that although no single feature taken by itself should give definite evidence of an intermixture of races, yet the general appearance of the natives, more particularly their features, might in many cases afford some slight presumption of it. After all we should hardly expect on a priori grounds that the Eskimos would be an absolutely pure race, meaning by pure that from those early times when first they separated from the rest of the human family and developed peculiar characteristics of their own they have preserved themselves rigidly free from all intermixture with other races. There is perhaps not a single race on the face of the earth which would answer to this definition. Now a fusion of races inevitably brings about

"1. The 13 Point Hope Eskimo men gave an average cephalic index of 78.2"

modifications in the physical types, as one descendant harks back to one line of ancestors and another to another. Within definite limits, therefore, a certain amount of heterogeneity, over and above what might be due to the varying conditions of life, is to be expected from every race, although for thousands of years it may have kept itself aloof from every other. It is interesting to remember in this connection that Petitot, the French missionary in the Mackenzie delta, speaks of four Eskimos with whom he travelled as presenting so many distinct types; one of them looked like a Scotchman or a Russian. Rasmussen, again, mentions a native of Cape York, in northern Greenland, who 'did not resemble in the least the type that is usually regarded as Eskimo. His face was narrow and clear-cut, his nose slightly aquiline ... he was more like a gypsy than an Eskimo.' Different explorers will naturally find different analogies according to their earlier experiences. Thus in the very region where Mr. Stefánsson was reminded of 'stocky, sunburned, but naturally fair Scandinavians,' Collinson had particularly remarked on the Jewish caste of countenance.[266]

I myself seemed to distinguish among the Copper Eskimos three distinct types, which, while they must not be taken to represent so many distinct races, would serve to warn us that we should not expect to find a wholly homogeneous people. There was first the type that all writers have so consistently depicted as peculiarly Eskimo, the rather fair-skinned native with lank black hair, somewhat short and squat, but with a round pleasant face, twinkling dark eyes that appear a little aslant as among Mongols, a

rather flat nose with a low bridge, and high cheek-bones. The second type was taller, with a longer face, a chin that was often pointed, eyes that occasionally appeared a little aslant, but more often were quite straight like our own, and a nose rather big and aquiline. A common type intermediate between these two gives a square, rather block-shaped face.

The third type was very different from either of the preceding two, at least in its extreme forms. One might almost be tempted to call it a Melanesian type, so short is the face, so thick the lips, and so broad and flat the nose. In all the features there is a coarseness and brutality that is altogether foreign to the average Eskimo. Dress such a man in European clothes and the most learned ethnologist might be puzzled to determine his race.

Whether such a division into types has any independent value, and whether there are similar types among the Eskimos elsewhere, we have not the date at present to decide. There is a certain amount of evidence to prove that many of the inland natives of northern Alaska are taller and more slender, and have longer and narrower faces, than the Eskimos farther east, and admixture with Indian blood is the usual reason assigned for it. It is possible that the same admixture has taken place, to a more limited extent, among the Copper Eskimos also; but apart from this, there seems not the slightest indication of any racial intermixture that we can trace, and certainly not the faintest

sign of any European elements.

To sum up, therefore, it seems clear that neither the color of the eyes, nor the color and shape of the hair, nor again the complexion of the Copper Eskimos, differentiates them in any way [267] from the other branches of their race, or lends any support to the theory of Scandinavian or even European admixture. If such an admixture had occurred we should expect to find its signs, not only in these more external features, but also in the stature and in the shape of the head. Mr. Stefánsson's own comparison--breadth of face with breadth of head--is inconclusive, firstly, because he has insufficient data of a similar nature from other Eskimo sources with which to compare his data from the Copper Eskimos, and, secondly, because it is not recognized by the best authorities as a consideration of major importance in determining questions of race. The principal feature that is employed for this purpose, the cephalic index, tends to show that the Copper Eskimos are as pure as the purest known branch of the Eskimo race of whom we have definite and detailed knowledge. Until, therefore, we are presented with more tangible and significant evidence, the theory of Scandinavian or even European infusion among the Copper Eskimos must be regarded as unproved, and indeed groundless."

23: Sullivan--225-228 (No date) 1922 Copper Eskimo
116, 144

"The "Blond" Eskimo-- A Question of Method

In the American Anthropologist for July-September, 1921, Diamond Jenness reopens the discussion of the cause of the reported 'blondness' in the Copper Eskimo. He takes the stand that the theory of Scandinavian infusion among these people is groundless. With this position I have no quarrel. Indeed, after an examination of some of the 'blond' hair, I am rather in sympathy with it. The first six pages of Mr. Jenness's article are as logical and critical as might be asked for. In these pages it is made clear that the 'blondness' referred to is by no means a Scandinavian blondness, but a slight diminution of pigmentation such as is quite frequently seen among Chinese, Japanese, Polynesians, Indians, and other Mongoloid peoples.

Mr. Jenness then undertakes to show by anthropometry that the Copper Eskimo are unmixed. He has apparently succeeded to his own satisfaction. It is to be feared, however, that his method will not meet with the approval of those who are in any degree inclined to be critical.

The author takes Mr. Stefánsson to task for using the transverse cephalo-facial and transverse cranio-facial indices as evidence of a Scandinavian or European infusion. He states that these indices are not standard and not those usually used in questions relating to race. Mr. Jenness goes on to inform us that 'the best indications in regard to

race, as far as physical measurements are concerned, are derived, according to the opinions of the leading anthropologists, from the stature, and the proportions of the length of the head to its breadth, i. e., the cephalic index.'

Now stature would be valuable in studying a mixture between Eskimo and Scandinavians because there is a tremendous difference in the average stature of the two groups. Yet it is apparently not for this reason that it has been selected by Mr. Jenness. He selected it because 'it is recommended by our leading anthropologists,' but he does not seem to know what to do with it. He chooses one group, the Ammassalik Eskimo, as purest, and another, the Southwestern [236] Greenland Eskimo, as the most mixed. Because the Southwestern Eskimo are shorter than the Ammassalik he reasons that intermixture with Scandinavians would result in a group with a shorter average stature than either parental group. If this be true, it is certainly something heretofore unknown. All studies in human hybridization point to an opposite conclusion. Hybrids are either intermediate between the two parental stocks or taller than either parental stock. The fallacy of the method employed is of course the comparison of two separate groups. The logical method of deducing the effect of intermixture would have been to have compared mixed and unmixed members of the same group.

When Mr. Jenness found the Copper Eskimo 19 and 26 millimeters taller than the male and female Ammassalik Eskimo, he concluded that this evidence might also be said to point against Scandinavian admixture. If we were to approve of the method of

comparing two groups we could only conclude that the reverse is true. It should also be mentioned that intermixture with Indians would probably affect stature in the same direction as would intermixture with Scandinavians. For this reason evidence from stature alone would not be conclusive.

In fairness to Mr. Jenness, it should be said that he does not make much of the difference in stature and apparently did not expect much from it. Most of his faith has been put in the cephalic index. Using the same method of inter-group comparison he finds:

Ammassalik men	77.6	women	76.7
Copper Eskimo men	76.9	women	75.6

From this he concludes:

The difference in the figures are so slight as to be practically negligible; they might, indeed, almost disappear if we had a greater number of cases to go by.

Ignoring the fact that the chances are just as great that the differences might increase 100 per cent, it is difficult to see what a strict coincidence would prove. Mr. Jenness does not tell us what result he expected from the intermixture of the two long-headed groups. The range of the cephalic index is about the same in the Scandinavian and Eskimo. From this it is of course apparent that the cephalic index is perhaps the most worthless criterion that could be selected.

Whether or not the transverse cephalo-facial index and the transverse cranio-facial index are standard, it is a fact that they, together [227] with absolute width of face, have proved the most useful criteria of race mixture between mongoloid stocks and the white races. Professor Boas has repeatedly used them to good advantage. Doctor Jenks, in an elaborate study of Indian-White amalgamation, used the same criteria effectively.

In studying the results of intermixture of two groups one naturally selects those characteristics that are most widely contrasted in the two parental groups. In the case at hand the most obvious differences between the Eskimo and Scandinavians are pigmentation, stature, width of face (and consequently transverse cephalo-facial and cranio-facial indices) and the index of the build. From an anthropometric standpoint absolute face width and the transverse cephalo-facial index are most satisfactory. There is a smaller amount of overlapping in the two groups in both of these characters than in most anthropometric traits. As stated above, the range and mean value for the cephalic index is practically identical in the Eskimo and Scandinavians and consequently we would not expect it to be altered in intermixture.

There is no universal standard for use in testing racial homogeneity. One thing is applicable in one case and another thing in another case. The cephalic index would be most useful in studying the effects of intermixture of Scandinavians and Lapps, North Italians and South Italians or the Apache and Pima. In studying the intermixture of

most mongoloid peoples and whites we should preferably use absolute face width, absolute bigonial diameter or the transverse cephalo-facial index. If we were dealing with Negro-White intermixture we should probably select the nasal diameters and proportions And so on. These other measurements and indices are just as standard as is the cephalic index.

In addition to criticising Mr. Jenness's selection of anthropometric criteria, I also object to his method of geographic comparison. By this I do not mean that the method is never valid or valuable. When we have a fairly complete and continuous geographical distribution of data such as exists for Sweden and Italy such comparison yields most conclusive results. But in camparing widely separated groups it is difficult to determine whether or not small differences are due to selection, environment, or intermixture. It is only when a mass of evidence points in the same direction that we can safely interpret it. The evidence under discussion is not of this type.

I do not wish to be understood as arguing for or against a Euro- [228] pean origin of 'blondness' in the Eskimo. My criticism is confined to the method employed in trying to establish the truth or falsity of the theory. My point is that as far as anthropometric evidence is concerned the question of the European or non-European origin of 'blondness' in the Eskimo stands exactly where it stood before Mr. Stefánsson and Mr. Jenness took up the discussion.

Let us hope that Mr. Jenness will give us a fuller presentation of the valuable data he possesses. It would be interesting if he could establish his three types anthropometrically. At least he should portray them photographically."

[P.17, A]

143 pears to be a cline from northwest to southeast, MS being replaced by Ns:

Population	MS	Ms	NS	Ns
Copper	0.1719	0.8703	0.0000	0.1578
West Hudson Bay	0.1524	0.6090	0.0000	0.2386
Baffin Island	0.1200	0.5943	0.0000	0.2857
Northeast Hudson Bay	0.1337	0.5646	0.0000	0.3017
Southeast Hudson Bay	0.0619	0.5662	0.0000	0.3719

114 The meaning of these differences is un-
143 certain. The ABO findings taken alone
144 could be used as evidence supporting the
● argument that the Eskimo living farthest
south in Hudson Bay have a large admixture of Indian blood; indeed to the absurdity that they are pure blood Indians. But both the Duffy and the MNSs data destroy this argument. In point of fact so far as the MNSs data go the closer geographically the Eskimo come to the modern Indians the farther they recede from them genetically. It would seem to us that, as more complete blood groups and other genetic data accumulate, one can but conclude that there is no close genetic relationship between the Eskimo and the Indians of today. They may perhaps stem from a common stock, but if so the primary branching occurred a long, long time ago, while there has been little grafting since. Equally in our own studies there is surprisingly little evidence for replacement of Eskimo genes by genes of Whites. Such are present certainly, but not in such numbers in the populations we have studied as seriously to disturb the inherent Eskimo gene frequencies. If neither of these is the explanation of the variations then that explanation must lie within the Eskimo population itself.

114 The archaeologists have painstakingly de-
143 fined at least two Eskimo cultures in the
144 eastern Arctic, the Dorset and the Thule.
174 It would seem to us not unlikely that the people of these cultures differed genetically, perhaps as much as the Indians of today do from the Eskimo, and that there

[P. 17, B]

may well be in the present Eskimo population a Dorset residuum which is genetically recognizable. It is hardly to be expected that such recognition will depend upon the presence of a strange gene in one population that is absent from the other, but rather upon differences of frequencies of genes already known or to be discovered, differences such as are indicated in the above data. One can as yet draw no firm conclusions, but certainly the indications are enough to make further genetic studies, even more complete than the present one, worth-while.

SUMMARY

Blood group gene frequencies were determined based on samples from 320 Copper Eskimo as follows: *O*, 0.6770; *A*, 0.2914; *B*, 0.0316; *M*, 0.8422; *N*, 0.1578; *S*, 0.1827; *s*, 0.8173; *MS*, 0.1719; *Ms*, 0.6703, *NS*, 0.0000, *Ns*, 0.1578; P_1, 0.1842, P_2, 0.8158; *CDe*(±*Cde*), 0.4985; *cDE*(±*cdE*), 0.4906; *cDe*(±cde), 0.0109; Fy^a, 0.7500; Fy^b, 0.2500. The following phenotypes were found to have a frequency of 1.00; Lu (a − b +), K − k + Kp(a − b +), Le(a−) and Sec. The following antigens were not present in the population tested: He, M^g, Mi^a, Vw, C^w, V, Di^a, Be^a, By^a, and Wr^a. Differences between this population and other Eskimo populations studied were noted in the ABO, MNSs and Duffy systems.

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ADDENDUM

Since this article was written we have obtained additional genealogical information from Mr. Wm. Joss, Manager of the